CLAIMS

1. A die-cuttable, biaxially stretch-oriented monolayer film comprising a polyethylene having a density of about 0.940 g/cm^3 or less, a propylene polymer or copolymer, or mixtures thereof, wherein the tensile modulus of the film in the machine direction is greater than the tensile modulus in the cross direction, the tensile modulus of the film in the cross direction is about 150,000 psi or less, and the film is free of copolymers of ethylene with an ethylenically unsaturated carboxylic acid or ester.

2. The film of claim 1 comprising a propylene copolymer.

3. The film of claim 2 wherein the propylene copolymer is a copolymer of propylene and up to about 40% by weight of at least one α-olefin selected from ethylene and α-olefins containing from 4 to about 8 carbon atoms.

4. The film of claim 3 wherein the α-olefin is ethylene or 1-butene.

5. The film of claim 1 comprising a polyethylene having a density of from about 0.890 to about 0.925 g/cm^3.

6. The film of claim 1 which is free of inert particulate filler.

7. The film of claim 1 containing inert particulate filler.

8. The film of claim 1 having a haze of less than about 10%.

9. The film of claim 1 having a haze of less than about 6%.

10. The film of claim 1 having a haze of less than about 2%.

11. The film of claim 1 wherein the stretch-orientation in the machine direction is greater than the orientation in the cross direction by at least about 10%.

12. The film of claim 11 wherein the film is oriented in the machine direction at a stretch ratio of from about 5:1 to about 10:1.

13. The film of claim 1 wherein the film contains at least one nucleating agent.

14. The film of claim 1 having a Gurley stiffness in the machine direction of from about 10 to about 50.

15. The film of claim 1 having a thickness of about 3.5 mils or less.

16. The film of claim 1 having a thickness of from about 2 to about 2.5 mils.

17. The film of claim 1 wherein the film has been biaxially stretch-oriented and heat set.

18. The film of claim 1 wherein the film comprises polyethylene having a density of from about 0.890 to about 0.925 g/cm^3.

19. The film of claim 1 wherein the film has been oriented in the machine direction at a stretch ratio of about 9:1 to about 10:1, and oriented in the cross direction at a stretch ratio of greater than 1:1 up to about 3:1.

20. The film of claim 19 wherein the stretch ratio in the cross direction is less than about 2:1.

21. The film of claim 1 having a friction energy of less than about 120 g-cm.

22. A die-cuttable, biaxially stretch-oriented monolayer film comprising polyethylene having a density of 0.940 g/cm^3 or less, a propylene polymer or copolymer, or mixtures thereof wherein the stretch orientation of the film in the machine direction is greater than the stretch orientation in the cross direction by at least 10%, the tensile modulus of the film in the cross direction is 150,000 psi or less, and the film is free of copolymers of ethylene with an ethylenically unsaturated carboxylic acid or ester.

23. The film of claim 22 wherein the stretch-orientation in the machine direction is greater than the stretch-orientation in the cross direction by at least about 20%.

24. The film of claim 22 wherein the film has been stretched in the machine direction at a ratio of from about 5:1 to about 10:1.

25. The film of claim 22 comprising a polyethylene having a density of from about 0.890 to about 0.925 g/cm^3.

26. The film of claim 22 comprising a copolymer of propylene and up to about 40% by weight of at least one olefin selected from ethylene and α-olefins containing from 4 to about 8 carbon atoms.

27. The film of claim 22 wherein the film has been stretch oriented in the machine direction at a ratio of from about 9:1 to about 10:1, and in the cross direction at a ratio of greater than 1:1 to about 3:1.

28. A die-cuttable, stretch-oriented multilayer film comprising

(A) a base layer having an upper surface and a lower surface, and comprising polyethylene having a density of about 0.940 g/cm^3 or less, a propylene homopolymer or copolymer, or mixtures thereof wherein the base layer is free of copolymers of ethylene with an ethylenically unsaturated carboxylic acid or ester, and

(B) a first skin layer of a thermoplastic polymer bonded to the upper surface of the base layer, wherein the tensile modulus of the multilayer film in the machine direction is greater than the tensile modulus in the cross direction, and the tensile modulus in the cross direction is about 150,000 psi or less.

29. The film of claim 28 wherein the base layer is free of inert particulate filler.

30. The multilayer film of claim 28 wherein the base layer comprises a propylene copolymer.

31. The multilayer film of claim 28 wherein the base layer comprises a propylene copolymer which is a copolymer of propylene and up to about 40% by weight of at least one α-olefin selected from ethylene and α-olefins containing from 4 to about 8 carbon atoms.

32. The film of claim 31 wherein the α-olefin is ethylene or 1-butene.

33. The multilayer film of claim 28 wherein the base layer comprises polyethylene having a density of from about 0.890 to about 0.925 g/cm^3.

34. The multilayer film of claim 28 wherein the first skin layer (B) contains inert particulate filler.

35. The multilayer film of claim 28 wherein the first skin layer (B) is free of inert particulate filler.

36. The multilayer film of claim 28 having a haze of less than 10%.

37. The multilayer film of claim 28 having a haze of less than 6%.

38. The multilayer film of claim 28 wherein the first skin layer comprises at least one polyolefin, polyamide, polystyrene, polystyrene-butadiene, polyester, polyester copolymer, polyurethane, polysulfone, polyvinylidene chloride, styrene-maleic anhydride copolymer, styrene acrylonitrile copolymer, ionomer based on sodium or zinc salts of ethylene methacrylic acid, polymethyl methacrylate, cellulosic, fluoroplastic, acrylic polymer and copolymer, polycarbonate, polyacrylonitrile, ethylene-vinyl acetate copolymer, and mixtures thereof.

39. The multilayer film of claim 28 wherein the base layer and the first skin layer are formed by coextrusion.

40. The multilayer film of claim 28 wherein the stretch-orientation in the machine direction is greater than the orientation in the cross direction by at least 10%.

41. The multilayer film of claim 28 which has been oriented in the machine direction at a stretch ratio of from about 5:1 to about 10:1.

42. The multilayer film of claim 28 wherein the base layer or first skin layer, or both, also contain a nucleating agent.

43. The multilayer film of claim 28 containing a second skin layer bonded to the lower surface of the base layer.

44. The multilayer film of claim 43 wherein the composition of the second skin layer is different from the composition of the first skin layer.

45. The multilayer film of claim 28 having a Gurley stiffness in the machine direction of from about 10 to about 50.

46. The multilayer film of claim 28 having an overall thickness of from about 2 to about 3 mils.

47. The multilayer film of claim 28 wherein the film has been biaxially stretch-oriented and heat set.

48. The multilayer film of claim 28 wherein the multilayer film has been stretch oriented in the machine direction at a ratio of from about 9:1 to about 10:1, and in the cross direction at a ratio of from greater than 1:1 to about 3:1.

49. The multilayer film of claim 28 having a friction energy of less than 120.

50. The multilayer film of claim 28 having a friction energy of less than 80.

51. A die-cuttable, biaxially stretch-oriented multilayer film comprising

(A) a base layer having an upper surface and a lower surface, and comprising polyethylene having a density of from about 0.940 g/cm^3 or less, a propylene polymer or copolymer, or mixtures thereof wherein the base layer is free of copolymers of ethylene with an ethylenically unsaturated carboxylic acid or ester, and

(B) a first skin layer of a thermoplastic polymer bonded to the upper surface of the base layer, wherein the stretch-orientation of the multilayer film in the machine direction is greater than the stretch-orientation in the cross direction by at least 10%, and the tensile modulus of the multilayer film in the cross direction is 150,000 psi or less.

52. The film of claim 51 wherein the stretch-orientation in the machine direction is greater than the stretch-orientation in the cross direction by at least about 20%.

53. The film of claim 51 wherein the film has been stretched in the machine direction at a ratio of from about 5:1 to about 10:1.

54. The film of claim 51 wherein the base layer comprises a copolymer of propylene and up to about 40% by weight of at least one α-olefin selected from ethylene and α-olefins containing from 4 to about 8 carbon atoms.

55. The film of claim 51 wherein the base layer comprises a polyethylene having a density of from about 0.890 to about 0.925 g/cm^3.

56. An adhesive containing labelstock for use in adhesive labels which comprises

(A) a die-cuttable, biaxially oriented multilayer film comprising

(A-1) a base layer having an upper surface and a lower surface, and comprising polyethylene having a density of about 0.940 g/cm^3 or less, a propylene polymer or copolymer, or mixtures thereof wherein the base layer is free of copolymers of ethylene with an ethylenically unsaturated carboxylic acid or ester, and

(A-2) a first skin layer of a thermoplastic polymer bonded to the upper surface of the base layer, wherein the tensile modulus of the multilayer film in the machine direction is greater than the tensile modulus in the cross direction, and the tensile modulus of the multilayer film in the cross direction is 150,000 psi or less, and

(B) an adhesive layer having an upper surface and a lower surface wherein the upper surface of the adhesive layer is adhesively joined to the lower surface of the base layer.

57. The labelstock of claim 56 wherein the base layer comprises a propylene copolymer.

3 ~~58.~~ The labelstock of claim ~~56~~ 1 wherein the base layer comprises a propylene copolymer which is a copolymer of propylene and up to about 40% by weight of at least one α-olefin selected from ethylene and α-olefins containing from 4 to about 8 carbon atoms.

4 ~~59.~~ The labelstock of claim ~~58~~ 3 wherein the α-olefin is ethylene or 1-butene.

5 ~~60.~~ The labelstock of claim ~~56~~ 1 wherein the base layer is free of inert particulate filler.

6 ~~61.~~ The labelstock of claim ~~56~~ 1 wherein the base layer comprises polyethylene having a density of from about 0.890 to about 0.925 g/cm^2.

7 ~~62.~~ The labelstock of claim ~~56~~ 1 wherein the multilayer film (A) has been biaxially stretch-oriented and heat set.

8 ~~63.~~ The labelstock of claim ~~56~~ 1 wherein the multilayer film (A) has a Gurley stiffness in the machine direction of from about 10 to about 50.

9 ~~64.~~ The labelstock of claim ~~56~~ 1 wherein the stretch orientation of the multilayer film (A) in the machine direction is greater than the stretch orientation in the cross direction by at least about 20%.

10 ~~65.~~ The labelstock of claim ~~56~~ 1 wherein the multilayer film (A) has been stretched in the machine direction at a ratio in the range of from about 5:1 to about 10:1.

11 ~~66.~~ The labelstock of claim ~~56~~ 1 wherein the adhesive layer is a pressure-sensitive adhesive layer.

12 ~~67.~~ The labelstock of claim ~~56~~ 1 wherein the multilayer film (A) has been oriented in the machine direction at a stretch ratio of about 9:1 to about 10:1, and stretch oriented in the cross direction at a ratio of greater than 1:1 up to about 3:1.

13 ~~68.~~ The labelstock of claim ~~67~~ 12 wherein the stretch ratio in the cross direction is less than 2:1.

14 ~~69.~~ A pressure-sensitive adhesive label die-cut from the labelstock of claim ~~56~~ 1.

70. A die-cuttable, biaxially stretch oriented monolayer film comprising at least one polyolefin wherein the film has been stretch oriented in the machine direction at a stretch ratio of about 9:1 to about 10:1, and in the cross direction at a stretch ratio of from greater than 1:1 to about 3:1.

71. The film of claim 70 wherein the stretch ratio in the cross direction is less than 2:1.

72. The film of claim 70 wherein the film comprises, polyethylene, a propylene polymer or copolymer, or mixtures thereof.

73. The film of claim 70 wherein the film comprises a copolymer or propylene and ethylene or at least one α-olefin containing from 4 to about 8 carbon atoms.

74. A die-cuttable, stretch oriented multilayer film comprising

(A) a base layer having an upper surface and a lower surface, and comprising at least one polyolefin,

(B) a first skin layer of thermoplastic polymers bonded to the upper surface of the base layer wherein the multilayer film has been stretch oriented in the machine direction at a stretch ratio of from 9:1 to about 10:1, and in the cross direction at a stretch ratio of greater than 1:1 to about 3:1.

75. The multilayer film of claim 71 wherein the multilayer film has been stretch oriented in the cross direction at a ratio of less than 2:1.

Add A2